

Strategic Bargaining and Cooperation in Greenhouse Gas Mitigations

An Integrated Assessment Modeling Approach

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Preface

If one is asked what is the hottest research area on a hot subject today, the answer is not nuclear fusion, but global warming. Climate change is hot because its effects would be felt by millions of people, rich and poor, and by all economies, large and small; the research on climate change is also hot because it encompasses many disciplines in both the natural and social sciences. Climate change is a complicated issue on a global scale that has drawn the attention of scientists, engineers, and policymakers. Economic analyses of climate change have been a useful instrument for untangling the thorny socioeconomic facets of global warming.

This research offers a fresh approach to the economics of climate change. In this study, economic modeling of climate change is incorporated with game-theoretic solution concepts. Such a connection bridges the two important research methodologies widely employed in the economics of climate change literature: integrated assessment (IA) modeling and game-theoretic modeling. My aim is to shed light on the behavioral aspects of IA modeling and provide game-theoretic modeling of climate change with richer economic substances. The new understanding derived from this research should help us to identify regions' behavior toward international agreements on greenhouse gas mitigations and to rethink various policy issues regarding such agreements.

The study is a comprehensive summary of my research activities in IA modeling. Many scholars in climate change research have inspired the work underlying this study. Foremost, I would like to express my sincere gratitude to William D. Nordhaus, whose guidance since my graduate student days has been invaluable. The RICE model envisioned and developed by him is a key component of this work. Carlo Carraro and Charles Kolstad have encouraged this research at

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